

AMENDMENTS TO THE CLAIMS

1-50. (Cancelled)

51. (New) A combination of:

at least one polymer in an aqueous solution which is capable of undergoing a transition that results in an at least two-fold increase in its viscosity, said at least one polymer being characterized by at least one of the following features:

having a viscosity at body temperature which is higher than 22,000 Pas following said transition;

having a molecular weight higher than 17,000 Daltons;

comprising a block copolymer having more than three blocks;

having a polymer degradation time generally similar to the time required for de novo chondrogenesis and osteogenesis; and

capable of undergoing a condensation reaction in the presence of water resulting in an increase in the molecular weight of the polymeric system; and

at least one of a source of Mesenchymal stem cells and at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor.

52. (New) A combination according to claim 51 and wherein said combination includes both said source of Mesenchymal stem cells and said at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor.

53. (New) A combination according to claim 51 and wherein said combination includes said source of Mesenchymal stem cells and does not include said at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor.

54. (New) A combination according to claim 51 and wherein said combination includes said at least one of demineralized bone matrix, demineralized tooth matrix,

bone morphogenic protein and bone morphogenic growth factor and does not include said source of Mesenchymal stem cells.

55. (New) A combination according to claim 51 and wherein said at least one polymer in an aqueous solution is capable of undergoing said transition in response to a triggering effect at a body site.

56. (New) A combination according to claim 55 and wherein said at least one polymer in an aqueous solution is capable of undergoing said transition in response to said triggering effect which includes a change in at least one of temperature and PH.

57. (New) A combination according to claim 52 and wherein said at least one polymer in an aqueous solution is capable of undergoing said transition in response to a triggering effect at a body site.

58. (New) A combination according to claim 57 and wherein said at least one polymer in an aqueous solution is capable of undergoing said transition in response to said triggering effect which includes a change in at least one of temperature and PH.

59. (New) A combination according to claim 51 and wherein said at least one polymer in an aqueous solution is characterized by at least one of the following features:

having a molecular weight higher than 17,000 Daltons;  
comprising a block copolymer having more than three blocks; and  
having a polymer degradation time generally similar to the time required for de novo chondrogenesis and osteogenesis.

60. (New) A combination according to claim 52 and wherein said at least one polymer in an aqueous solution is characterized by at least one of the following features:

having a molecular weight higher than 17,000 Daltons;  
comprising a block copolymer having more than three blocks; and  
having a polymer degradation time generally similar to the time required for de novo chondrogenesis and osteogenesis.

61. (New) A combination according to claim 51 and wherein said at least one polymer in an aqueous solution is characterized by at least one of the following features:  
having a molecular weight higher than 17,000 Daltons;  
comprising a block copolymer having more than three blocks; and  
having a viscosity at body temperature which is higher than 22,000 Pas following said transition.

62. (New) A combination according claim 51 and wherein said at least one polymer in an aqueous solution is characterized by at least one of the following features:  
having a molecular weight higher than 17,000 Daltons; and  
comprising a block copolymer having more than three blocks.

63. (New) A combination according to claim 51 and wherein said at least one polymer in an aqueous solution is characterized in having a viscosity at body temperature which is higher than 22,000 Pas following said transition.

64. (New) A combination according to claim 51 and wherein said source of Mesenchymal stem cells is bone marrow.

65. (New) A combination according to claim 51 and wherein said combination includes at least one of said demineralized bone matrix and said demineralized tooth matrix.

66. (New) A combination according to claim 51 and wherein said combination also comprises living cells selected from the group consisting of endothelial cells, hepatocytes, astrocytes, osteoblasts, chondrocytes, fibroblasts and miocytes.

67. (New) A combination according to claim 51 and wherein:  
said combination includes said source of Mesenchymal stem cells;  
said source of Mesenchymal stem cells is bone marrow;  
said combination also includes said demineralized bone matrix;

said at least one polymer in an aqueous solution is a segmented block copolymer exhibiting reverse thermo gelating properties and comprising polyethylene oxide (PEO) and polypropylene oxide (PPO) chains;

        said chains are connected via a chain extender; and

        said chain extender is phosgene.

68. (New)   A method for regenerating musculoskeletal tissue other than bone, the method comprising:

    forming a combination of at least one polymer in an aqueous solution which is capable of undergoing a transition that results in an at least two fold increase in its viscosity and a source of Mesenchymal stem cells; and

    thereafter applying the combination to existing musculoskeletal tissue.

69. (New)   A method according to claim 68 and further comprising combining at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor with said combination prior to said applying.

70. (New)   A method according to claim 69 and wherein said transition takes place in response to a triggering effect at a body site.

71. (New)   A method according to claim 70 and wherein said transition takes place in response to said triggering effect which includes a change in at least one of temperature and PH.

72. (New)   A method according to claim 69 wherein said source of Mesenchymal stem cells is bone marrow.

73. (New)   A method according to claim 69 and wherein said at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor includes at least one of said demineralized bone matrix and said demineralized tooth matrix.

74. (New) A method according to claim 69 and also comprising combining living cells selected from the group consisting of endothelial cells, hepatocytes, astrocytes, osteoblasts, chondrocytes, fibroblasts and miocytes with said combination prior to said applying.

75. (New) A method for regenerating musculoskeletal tissue comprising:  
initially forming a combination of a source of Mesenchymal stem cells and at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor;  
thereafter adding to said combination at least one polymer in an aqueous solution which is capable of undergoing a transition that results in an at least two fold increase in its viscosity, and;  
thereafter applying the combination to existing musculoskeletal tissue.

76. (New) A method according to claim 75 and wherein said transition takes place in response to a triggering effect at a body site.

77. (New) A method according to claim 76 and wherein said transition takes place in response to said triggering effect which includes a change in at least one of temperature and PH.

78. (New) A method according to claim 75 wherein said source of Mesenchymal stem cells is bone marrow.

79. (New) A method according to claim 75 and wherein said at least one of demineralized bone matrix, demineralized tooth matrix, bone morphogenic protein and bone morphogenic growth factor includes at least one of said demineralized bone matrix and said demineralized tooth matrix.

80. (New) A method according to claim 75 and also comprising combining living cells selected from the group consisting of endothelial cells, hepatocytes, astrocytes,

osteoblasts, chondrocytes, fibroblasts and miocytes with said combination prior to said applying.